CRITICAL CAUSES FACTOR OF FALL ACCIDENT IN CONSTRUCTION SITE

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ABSTRACT

The construction industries are a very dangerous environment which had a history of a relatively high number of injuries in comparison of other industries. Work at the high level has a tendency to involve in fall accident. Falls accident is one of the major leading causes of work facilities that occur to labor in the construction site. The aim of this study to investigate the safety problem in construction site, then identify the critical cause factor of fall accident in construction site, the solution and analysis the factors. The data was collected through interview, industrial visit,constructed and distiburted questionnaire in order to indentify the safety requirements in construction site. All of the interview and research questionnaire survey are conducted among contractor in company area Kuala Lumpur and Kuantan, Pahang. Returned questionnaire were analyses with average index to rank the factor of causes fall accident and frequency analysis method to identify the safety aspect in construction site. From the analysis find that unsafe behavior is the critical causes of fall accident in costruction site. In conclusion with existance of this study, it can boost up knowledge about safety and the company can be aware to prevent the fall accident from happen in the construction site.

ABSTRAK

Industri pembinaan adalah persekitaran yang sangat merbahaya yang mempunyai sejarah yang mempunyai nilai relatif angka kecederaan berbanding industri lain. Bekerja di tempat tinggi memiliki kecenderungan untuk terlibat dalam kemalangan jatuh. Kemalangan jatuh adalah salah satu punca utama kemudahan kerja yang berlaku kepada tenaga kerja dalam pembangunan. Objektif kajian ini untuk menyiasat masalah keselamatan di lokasi pembinaan, kemudian mengenalpasti kritis faktor penyebab kemalangan jatuh di tapak pembinaan,serta penyelesaiannya dan analisis faktor-faktor berikut. Data dikumpulkan melalui wawancara, lawatan industri, borang soal selidik untuk mengenal pasti keperluan keselamatan di lokasi pembinaan. Semua wawancara dan survei boring kaji selidik dilakukan di antara syarikat kontraktor di Kuala Lumpur dan Kuantan,Pahang.Borang soal selidik yang telah diisi,dianalisis dengan indeks untuk menentukan kedudukan faktor penyebab kemalangan jatuh dan kaedah analisis frekuensi untuk mengenalpasti aspek keselamatan dalam pembinaan.Rumusan bagi kajian ini mendapati,tingkah laku tidak selamat menjadi factor utama berlaku kemalangan jatuh dari tempat tinggi.Di dalam kajian ini, boleh meningkatkan pengetahuan tentang keselamatan dan syarikat boleh berhati-hati untuk mengelakkan kemalangan jatuh daripada berlaku di tapak pembinaan.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The building construction industry plays a major role in the economy of the state of Malaysia. The construction industries are a very dangerous environment which has had a history of a relatively high number of injuries in comparison of other industries. In most countries, falls are one of the major leading causes of work facilities that occur to labor in the construction site. According to the Bureau of Labor Statistics (2002), the construction industry accounted for 20% of the workplace fatalities across all industry sectors in 2000, and 8.8% of the occupational injuries and illnesses. The fatality rate in construction is regularly exceeded only by the worker fatality rate in mining and agriculture.

Construction is often classified as a high risk industry because it has historically been plague with much higher and unacceptable injury rates when compared to other industries (Abd.Ghani Khalid, 1996). Sawach et.al, (1999) discussed various variables that influence safety on construction sites. The impacts of the historical, economical, psychological, technical, procedural, organizational and environmental issues are considered in terms of how these factors are linked with the level of site safety.

Construction accident does not only result in human injuries but also financial injuries. The accident not only terrible human tragedies but also substantial economic cost because accidents also cause legal cost, increased insurance premium damage plant and equipment. Any accident in construction site involves direct and indirect cost to a firm. The direct cost are those costs incurred as a direct result of a accident, including the cost of transportation the injured worker to the nearest medical facility, medical expanses wages paid to the injured worker, liability costs and damaged equipment and material. Indirect cost is any additional cost generated by the accident occurrence, investigation and cost hiring the temporary replacement (Hinze and Applegate, 1991). Fang et.al (2006) conducted a comprehensive safety climate questionnaire on all sites of a leading construction company and its subcontractors in Hong Kong.

The results of this study were then compared to previous research studies. The findings revealed significant statistical relationships between safety climate and personal characteristics, including safety knowledge, direct employer and individual safety behavior. Ultimately, these findings could provide useful information for construction managers and safety practitioners in the construction industry to improve their safety culture. According to a Business Round Table report (Construction Industry Institute, 1988).

The cost of an effective construction safety and health program in the USA is approximately 2.5% of direct labor costs. Successful safety programs have been developed by many construction companies and have shown remarkable results. Dupont's safety training and observation program achieved good results in reducing work-place accidents (Peyton and Rubio, 1991).

1.2 Background of problem

Accidents are the direct results of unsafe activities and conditions both can be controlled by management. Over the years, the construction industries reported the highest rates of work-related injuries and deaths. Occupational Safety and Health Administration (OSHA) has identified the top four causes of fatalities namely falls, being stuck by equipment or machineries, electrocution, and caught in between equipment. High-rise building can be classified when the Buildings between 75 feet (23 m) and 491 feet (150 m) high or more than 4 level are, by some standards. Evelyn et al., (2005) presented the results of a postal survey of contractors in Singapore.

The findings revealed that site accidents are more likely to happen when there are inadequate company policies, unsafe practices, and poor attitudes of construction personnel, poor management commitment and insufficient safety knowledge and training of workers. The study recommended that project managers must pay more attention regarding the factors identified above to help enhance safety performance on construction sites and reduce the frequency of accidents. The workers have the risk to involve in accident. Fall accident in construction not the rarely problem. It may happen everywhere and every time if we neglect the safety.

There have been several researches in the pass done concerning falls. Duncan and Benent in 1991 stated that there are two (2) measures are those that prevent the workers from fall an active and passive measure. Morris and Isaac (1980) defined falls as an up toward event in which the patient comes to rest unintentionally on the floor. Singh in 2000 investigated fall accidents occurring on low-rise roofs and evaluated some innovation fall protection measures. From the investigation concluded that no single method of fall prevention would prevent. However in Malaysia, the construction industry accident rates are not as high as in other countries but number of accident is still alarming.

Table 1.1 : Number of Construction Accidents and Construction Fatalities, 2000-2005(SOCSO Annual Report, 2005)

YEAR	2000	2001	2002	2003	2004	2005
Construction Accidents	4,873	4,593	5,015	4,654	4,445	3,150
Construction fatalities	159	89	88	95	81	77

OSHA also suggested several methods to control fall hazards, including elimination of or substitution for the operation that can lead to falls, use of engineering controls guard against falls, informing and reminding workers at risk to void fall hazards and appropriate use of personal protection equipment (PPE) (Huang and Hinze,2003). Bakri et al., 2006 stated that the one key success is by minimizing cost of project. Providing a safe and health workplace is one of the most effective strategies for holding down the cost of doing construction business.

Table 1.2: Cases of Accident in Construction Site, 2007

(Department of Occupational Safety and Health Annual Report, 2007)

	Date	Accident	Location
i.	21 Jan 2007	Fall from roof	Construction Site,Negeri Sembilan
ii.	12 Mar 2007	Fall from 7th to 2nd floor	Construction Site,Kuala Lumpur
iii.	28 Mar 2007	Fall of worker from platform of scaffolding	Construction Site,Melaka
iv.	02 Apr 2007	Fall from Height	Construction Site,Selangor
v.	14 Apr 2007	Fall from 6th floor	Construction Site,Selangor
vi.	01 Jun 2007	Fall from 1st floor	Construction Site.Selangor
vii.	20 Aug 2007	Fall from scaffolding	Construction Site,Negeri Sembilan
viii.	10 Oct 2007	Crushed to death by excavator	Logging Site,Sarawak
ix.	15 Oct 2007	Fall from lorry	Plantation,Pahang
x.	17 Dec 2007	Struck by flying rock	Construction Site,Perak

The accident will cause the injury and sometimes lost the life for workers and the negative effect is the construction will be stop for investigate causing delay to happen. The cost resulting from injuries and equipment damage, combined with the associated financial loss resulting from schedule disruptions, insurance hikes, and workers compensation, impact the profitability of any construction operation. These costs may be minimized or avoided through focused safety efforts on construction job sites. Kjoo-Jin and David (2006) considered the issue of safety risks on construction sites.

The authors stated that safety managers needed to be aware of the direct causes of accidents as well as the indirect factors that adversely affect on site safety. In addition, the authors presented a theory of safety planning method which estimated the risk distribution of a project and helped the safety manager to both estimate situations of concentrated risk and to reschedule them when necessary. The advancement in social science has promoted a greater awareness of the sanctity of life and the unacceptability of premature death due to accidents. Accidents at construction sites are identified as a major problem throughout the world. So, the accident report is very important for the industry to investigate and prevent reoccurrence of the accident.

1.3 Problem statement

In the construction project, money is the important thing. To get the success project, we must consider on quality, time and cost. All three main points are related with safety. If safety is negligible, it may affect the time of completing the project, and also can increasing the cost. Of course the quality of the company and project cannot be maintained. Accident will be happen if worker and the company did not follow the safety regulation. Fall accident is one of the factors increasing the construction fatalities nowadays. If fall accident happens, it may influence the injuries or die, the cost and the company reputation. This problem will always increasing if all parties did not together to reduce the number of cases. The company needs to identify the causes of the fall accident. Therefore, the objectives for this study are to investigate the safety problem in construction site and identify the critical factor of fall accident and the solution also analysis the causes of fall accident.

1.4 Objectives

The aim of this study is to provide general perspectives of safety in construction site. The specific objectives of this study are:-

i. To investigate the safety problem in construction site especially who work at the high place.

ii. To identifies the factor of cause fall accident in construction site and the solution.

iii. To analysis the factor that influences the accident and the precaution steps.

1.5 Scope of study

Scope of this study is focused on safety in construction site, the safety problem and the solution. This research project focuses on high-rise building, high place where activities are being carried out under private and government department. The companies will be involved for this study is around Kuala Lumpur and Kuantan,Pahang.

1.6 Methodology

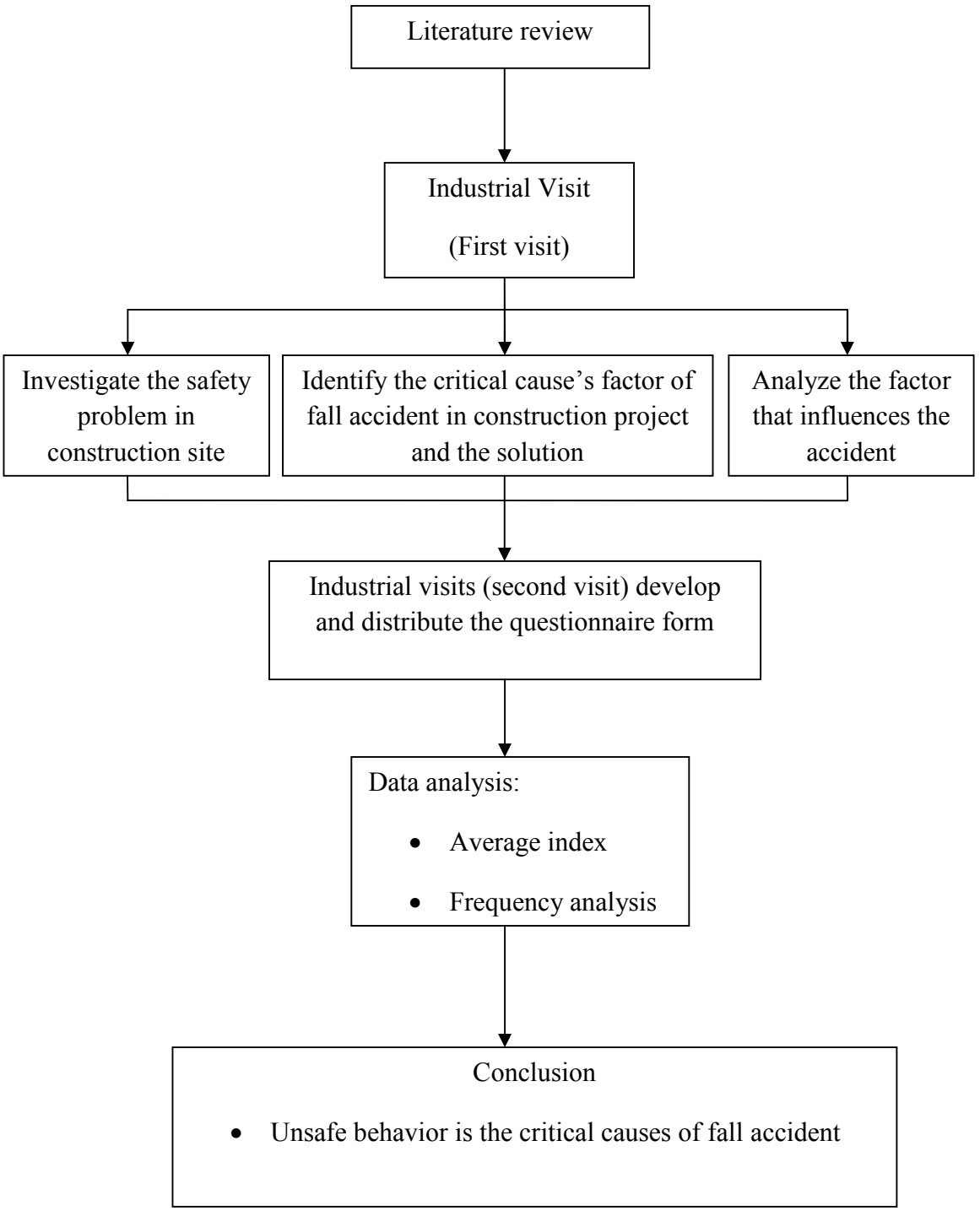

Figure 1.1: Summarized of Methodology

Figure 1.1 shows the summarized of this project. It is important to fulfill the objectives. For this research, it starts with the literature review from the journal, news, books and others. For the first industrial visit functional as to survey the site and company's project. Set of questionnaire can distribute during this visit. For this industrial visit, safety problem in construction site can be investigate, the critical causes factor of fall accident can be identify. For the second industrial visit is important to collect all the set of questionnaire for analyze. All the questionnaire will be analyze using average index and frequency analysis. After done analyze all the questionnaire, conclusion will be obtain.

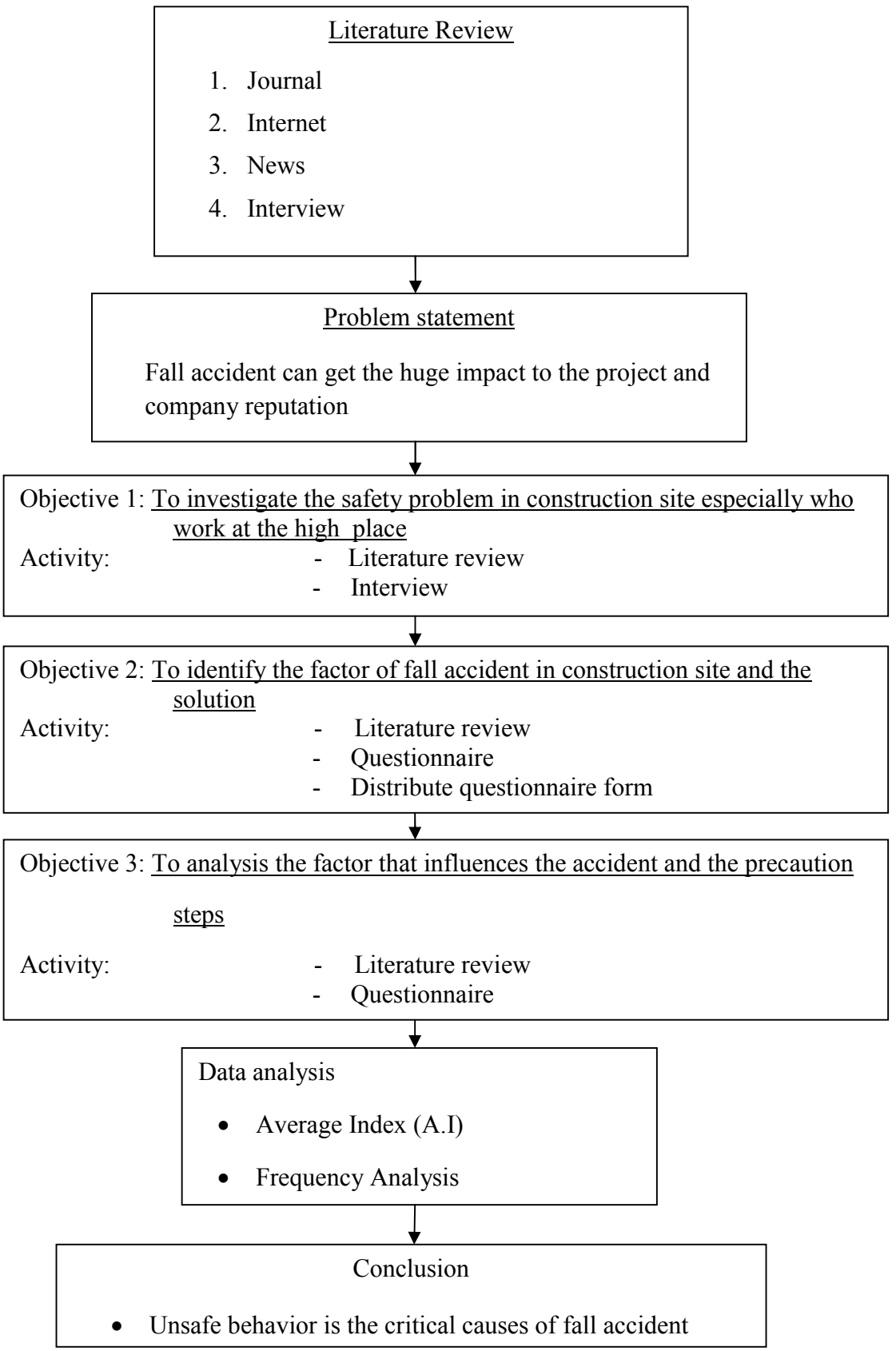

Figure 1.2: Flow chart of Methodology

1.7 Significant of study

The successful construction project can be determine by four aspect; time, cost, quality and safety. Without money, the project cannot complete in a due date. Safety can make the same impact with the money. If accident happen, it may disturb the time of project, it may delay some a few day or a month. It may increase the cost, besides; the quality of management will be decrease. So, from this study will help to measure the safety in a construction project. Besides, the management can be provide the precaution step and try to avoid an accident. As a result, the statistic of accident can be decreasing and the quality of project can be maintain and complete on the time.

1.8 Expected Outcome

At the end of this course, the management would be able to apply and used the suggestion precaution step to prevent an accident. The workers and the contractor can be understand safety aspect and follow the rule.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Fall from buildings and other fixed structures have focused on the construction site. Nowadays, to minimize the area for the construction, all project managers take the opportunity to built high-rise building. It also suitable for our country which is did not have earthquake and four seasons. In this chapter, there are several part will be discussed which are Occupational Safety and Health Act (OSHA), types of falls accident and the causes of the fall accident. OSHA has identified the top four causes of fatalities namely falls being struck by equipment or machinery, electrocution and caught in between equipment (US Department of Labor, 2008).Construction industry in Malaysia have been identified as one of the most hazardous activities. Awang (2007) reported out of 73858 industrial accidents recorded in 2003, while 4654 accidents were come from the construction industry where 2.0 % or 95 cases resulted in death.

Figure 2.1 shows the number of accidents reported to Social Security Organization (SOCSO) from 1993 to 2003 whilst Figure 2.2 shows the number of fatalities in construction industries for the same period.

Figure 2.1: Number of Construction Industry Accidents from 1993-2003 (*Awang, 2007*)

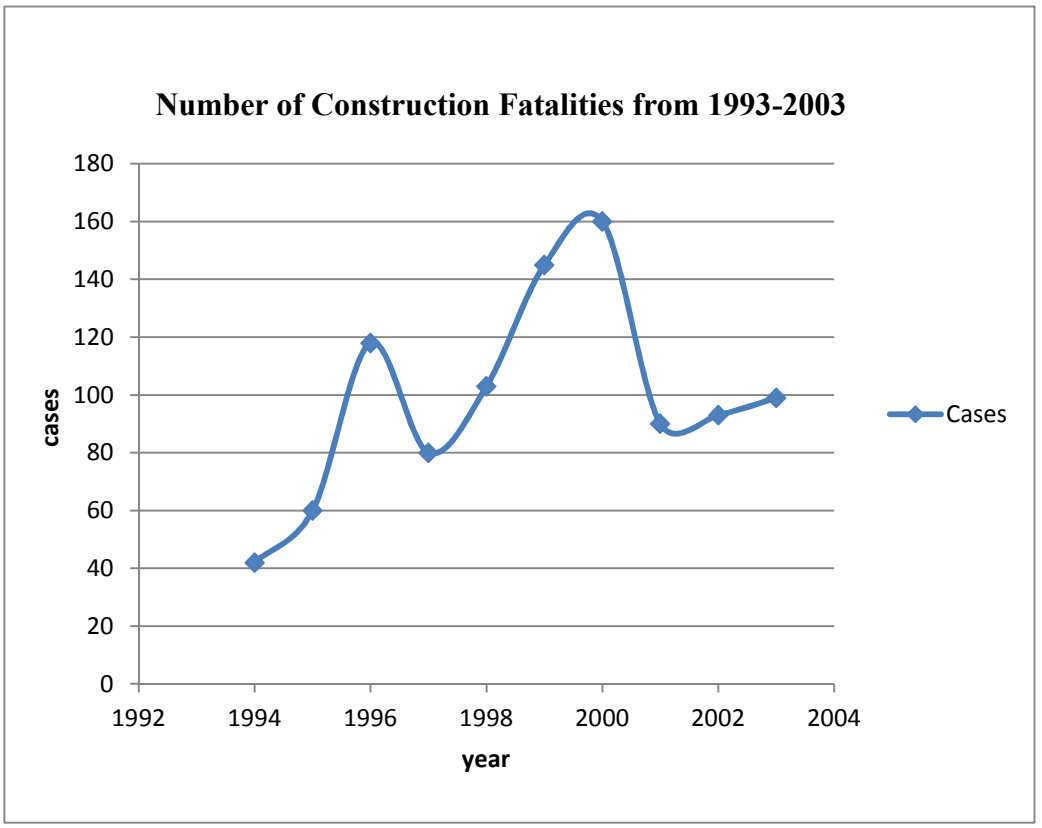

Figure 2.2: Number of Construction Fatalities from 1993-2003 *(Awang, 2007)*

The common source of fatalities in recent years has been injury,acounting for almost one-third of the total.Following the introduction of the construction (Head Protection) Regulation on 1 April 1990,in most years,at least 40 % of all construction have been falls from height.